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09/25/2003

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07/17/2006

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EXAMINER

TRINH, MINH N

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 07/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of claims 1-12 in the reply filed on 6/12/06 is acknowledged. Thus, claims 13-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse.

### *Claim Objections*

2. "[c1]. . . [c12] (claims 1-12, line 1) should be changed to: --1 . . . 12--.

Further, it is not clear as to what being referred as "depanelizing the plurality of plurality of individual circuits" (claim 12). Please be more specific.

### *Drawings*

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations of claims 11 and 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

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is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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5. Claims 1, 3, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plepys et al (6140707) in view of Hoffmeyer (5,757,073). Plepys et al discloses a method for manufacturing a printed circuit bonded to a stiffener as heat sink, comprising: producing the printed circuit 50 comprising at least one conductive layer circuit pattern 62 laminated to at least one side of a dielectric layer 60; first adhering a first side of a bond film 58 to the printed circuit 50, wherein the first adhering conforms the printed circuit to the bond film to substantially remove air entrapment between the printed circuit and the bond film (as shown in Fig. 2); and second adhering a second side of the bond film top surface as shown in Fig. 2 to the stiffener as heat sink. Note that if argues that the reference number 52 is not a heat sink applicant is referring to the discussion at col. 6 where the 52 structure can be made from either conductive or nonconductive material.

Further in supporting for the above, the Hoffmeyer discloses the bonding of a heat sink 22 to a second surface of the adhesive 26 or 28(see Fig. 1, and the discussion at col. 5, lines 45-60). Therefore, it would have been obvious to combine the above teachings as to form a desired package assembly that having the heat sink structure therefrom by using adhesive.

As applied to claims 3, 7 and 11 the limitations recited in these claims are also met by the Plepys et al (see process Figs. 2-3).

6. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fraivillig (6,015,607) in view of Hoffmeyer (5,757,073).

Fraivillig discloses a method for manufacturing a PCB bonded to a heat sink comprising: a first step of: adhering a conductive layer to a first surface of a bond film using a first adhesive layer to produce a circuit substrate (as discussed in the abstract, or discussion at col. 5-6), wherein the adhering is achieved by partially activating the first adhesive layer such that the conductive layer is tack bonded to the bond film, processing the circuit substrate to produce a flexible printed circuit (see Fig. 3, col. 5, lines 60-67, col. 6, lines 1-26). Hoffmeyer discloses a second step where the laminating the heat sink 22 to a second surface of the bonded film 26 or 28 of the printed circuit 50 using a second adhesive layer 26 (see Fig. 1, and the discussion at col. 5, lines 48-52). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the teaching of Hoffmeyer on the method invention of Fraivillig in order to facilitate the fabrication process including mechanical attaching of heat sink to the flexible substrate by adhesive bonding or the like. It is also noted that a related Figs. 1-2 of Hoffmeyer depicts a heat sink assembly includes heat sink 22 that is bonded to a second surface of bond film 26 or 28 by means of bonding adhesive.

As applied to claims 2-3, noting in light of Fraivillig's discussion at col. 5, lines 38-40 and col. 6, lines 39-55, which discloses the temperature range and the modification of the temperature range for better bonding result.

As applied to claims 4-5, noting Fraivillig as discussed at col. 8, lines 10-15 that the coating of the heat sink by a primer 138 having thickness from 0.5 to at least 2 microns, etc.

As applied to claims 6-7, Fraivillig discloses the limitation of claim 6 (see the discussion at col. 5, lines 60-67), and limitation of claim 7(see col. 6, lines 4-9).

As applied to claims 8-9 noting the Hoffmeyer discloses limitation of these claims where the bonding adhesive includes two adhesive layers 26, 28 and a dielectric layer 52 (see Fig. 1 and the discussed at col. 8, lines 20-21).

7. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fraivillig (6,015,607) in view of Hoffmeyer (5,757,073). As applied to claim 10, regarding the bond film includes ceramic powder filler. It would have been an obvious matter of design choice to choose the bond film having the above configurations, since applicant has not disclosed that the above claimed feature is critical and patentable distinguishing features and it appears that the invention would perform equally well with the type of bonding adhesive as provided by either of the prior art reference.

As applied to claim 12, it is inherently as to depanelizing the plurality of circuit before the second adhering step. Further, it would have been an obvious matter of design choice to depanelizing the plurality circuits in prior to the second adhering as to form each individual printed circuit, since applicant has not disclosed that such process as discussed above is critical and patentable distinguishing features and it appears that the invention would perform equally well with the teaching of forming at least one printed circuit as disclosed by either of the prior art references.

### ***Conclusion***

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8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited for their teaching of "heat sink manufacturing method".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (571) 272-4569. The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

mt  
7/7/06

  
**MINH TRINH**  
**PRIMARY EXAMINER**